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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,759	07/30/2004	Ryan McGee	81105828 / FMC 1797 PUS	4758
28395	7590	05/01/2006	EXAMINER	
BROOKS KUSHMAN P.C./FGTL 1000 TOWN CENTER 22ND FLOOR SOUTHFIELD, MI 48075-1238			BOATENG, ALEXIS ASIEDUA	
			ART UNIT	PAPER NUMBER
			2838	

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.		Applicant(s)	
	10/710,759		MCGEE ET AL.	
	Examiner		Art Unit	
	Alexis Boateng		2838	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/30/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Terada (U.S. 6,456,041).

Regarding claim 1, Terada discloses wherein a method for controlling battery discharge power limits for an electric battery in a vehicle powertrain, the electric battery being a source of power for an electric motor, the electric battery having a calibrated voltage set point that defines limit for battery discharge voltage, the method comprising:

computing an estimated electric battery power limit during battery discharge (column 2 lines 1 – 7: a sum of discharge capacity is determined by discharge refreshment);

measuring commanded electric battery power (column 4 line 63 – column 5 line 34: the battery control section functions as a capacity learning means and determines the maximum capacity);

determining whether commanded electric battery power exceeds an estimated battery power limit (column 7 lines 10 – 25: when the battery capacity is over a certain value the process is skipped to the end);

measuring actual battery voltage limit (figure 2 item 125: voltmeter);

computing a modified battery power limit if the actual battery voltage exceeds the battery discharge voltage limit (column 7 lines 10 – 25: when the discharge amount is greater than a certain value, the battery capacity is determined).

Regarding claim 2, Terada discloses wherein a method for controlling battery charge power limits for an electric battery in a vehicle powertrain, the electric battery being a source of power for an electric motor, the electric battery having a calibrated voltage set point that defines limit for battery charge voltage, the method comprising:

computing an estimated electric battery power limit during battery charging (column 4 line 63 – column 5 line 34: battery control sections determines battery capacity);

measuring commanded electric battery power (column 4 line 63 – column 5 line 34: measures the battery capacity);

determining whether commanded electric battery power exceeds an estimated battery power limit (column 7 lines 10 – 25: when battery capacity is over a certain value the process is skipped to the end);

measuring actual battery voltage limit (figure 2 item 126: voltmeter);

computing a modified battery power limit if the actual battery voltage exceeds the battery charge voltage limit (column 7 lines 10 – 25: when the charge amount is greater than a certain value, the battery capacity is determined).

3. Claims 3, 4, 7 – 9, 11 – 14, 16 – 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Cawthorne (U.S. 2005/0077867).

Regarding claim 3, Cawthorne wherein a method for controlling battery discharge power limits for an electric battery in a vehicle powertrain, the battery being a source of power for an electric motor, the battery having a calibrated voltage set point that defines a limit for battery discharge voltage, the method comprising:

measuring actual battery current (paragraph [0047]: senses battery current);

measuring an error between the battery discharge voltage set point and the actual voltage in a voltage closed loop feedback control (paragraph [0073]: measures error);

determining a battery discharge power limit (paragraph [0071]: determines power limit);

computing a voltage proportional term and a voltage integral term based on error (paragraph [0073] – [0076]: the proportional term being the derivative of the voltage reference and the voltage integral being the undervoltage reference value (as a function of voltage and time)); and

multiplying the sum of the proportional term and the integral term by the actual battery current to obtain a power limit modification thereby preventing a battery discharge voltage in excess of the battery discharge set point (paragraph [0073] – [0076]).

Regarding claim 4, Cawthorne wherein a method for controlling battery charge power limits for an electric battery in a vehicle powertrain, the battery being a source of power for an electric motor, the battery having a calibrated voltage set point that defines a limit for battery charge voltage, the method comprising:

measuring an error between the battery charge voltage set point and the actual voltage in a voltage closed loop feedback control (paragraph [0059]);

determining a battery discharge power limit (paragraph [0056]);

computing a voltage proportional term and a voltage integral term based on error (paragraph [0056] – [0060]: the proportional term being the derivative of the voltage reference and the voltage integral being the overvoltage reference value);

measuring actual battery current (paragraph [0056]); and

multiplying the sum of the proportional term and the integral term by the actual battery current to obtain a power limit modification thereby preventing a battery charge voltage in excess of the battery charge set point (paragraph [0056] – [0060]).

Regarding claim 7, Cawthorne discloses wherein a control system for a battery power limit in a vehicle powertrain in which a battery is a vehicle power source comprising:

- a battery controller (paragraph [0047]; figure 2 item 21);

- a motor driveably connected to a power output, the motor being electrically coupled to the battery controller (figure 2 item 56; paragraph [0038] – [0043]);

- a vehicle system controller for receiving driver commands and delivering control commands to the motor (figure 2 item 43; paragraph [0049]);

- a proportional-integral controller with a battery voltage set point input, a battery voltage input and a battery current input (figure 7 item 124);

- a comparator communicating with the vehicle system controller and the proportional-integral controller whereby battery power limits are compared to power limits established by the battery controller (figure 14 item 120; paragraph [0058] – [0059]);

- the vehicle system controller being configured to develop battery power commands in response to driver commands (figure 2 item 43; paragraph [0049]);

and

a power limit closed loop communicating with the proportional-integral controller and with the battery whereby a power limit for the battery is modified to maintain battery voltage a value that does not exceed the battery voltage set point (paragraph [0054]).

Regarding claim 8, Cawthorne discloses wherein the battery voltage set point is a battery discharge voltage set point (paragraph [0056] – [0058]).

Regarding claim 9, Cawthorne discloses wherein the battery voltage set point is a battery charge voltage set point (paragraph [0056] – [0058]).

Regarding claim 11, Cawthorne discloses wherein the error is clipped to positive values whereby the proportional term modifies the battery discharge power limit only if the actual voltage is below the discharge voltage set point (paragraph [0064]).

Regarding claim 12 and 17, Cawthorne discloses wherein the clipped error signal is multiplied by a proportional gain to compute the proportional term (paragraph [0064]).

Regarding claim 13 and 18, Cawthorne discloses wherein the integral is prevented from increasing if the power limit modification is greater than the limit for battery discharge voltage (paragraph [0073] – [0075] : undervoltage value is forced down).

Regarding claim 14 and 19, Cawthorne discloses wherein the integral term is reset to zero if the integral term becomes negative (paragraph [0084] – paragraph [0085]).

Regarding claim 16, Cawthorne discloses wherein the error is clipped to negative values whereby the proportional term modifies the battery discharge power limit only if the actual voltage is below the charge voltage set point (paragraph [0076]).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terada (U.S. 6,456,041) in view of Kendall (U.S. 5,619,417).

Regarding claims 5 and 6, Terada does not disclose the invention as claimed. Kendall discloses in column 4 lines 36 – 60 and in column 22 – 45 wherein a low pass filter with a time constant varied based on noise filters the current. At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Terada system with the Kendall system so that the battery can charge up faster at the lower frequencies.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cawthorne (U.S. 2005/0077867) in view of Terada (U.S. 6,456,041).

Regarding claim 10, Cawthorne does not disclose the invention as claimed.

Terada discloses in figures 7 and 8 wherein the battery current is clipped during

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discharge to values greater than or equal to zero. At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Cawthorne system with the Terada system so that battery can be properly discharged and does not become overdischarged.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cawthorne (U.S. 2005/0077867) in view of Joko (U.S. 5,939,861).

Regarding claim 15, Cawthorne does not disclose the invention as claimed.

Joko discloses in column 24 lines 15 – 38, wherein the current is clipped during charging to values less than or equal to zero. At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify the Cawthorne system with the Joko system so that system is not damaged by overcharging.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexis Boateng whose telephone number is (571) 272-5979. The examiner can normally be reached on 8:30 am - 6:00 pm, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB


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